

WHAT IS CLAIMED IS:

1. An apparatus for measuring a three-dimensional shape of an object to be measured by irradiating and scanning the object
5 with a laser light, the apparatus comprising:

optical means for dividing the laser light into a plurality of beams with having a predetermined angle in between for the irradiation; and

discriminating means for reading out and discriminating
10 each of a plurality of reflected laser light beams, the plurality of the reflected laser light beams corresponding to the plurality of divided beams, respectively, the plurality of divided beams being used for the irradiation by the optical means.

15

2. The apparatus for measuring a three-dimensional shape according to Claim 1, wherein

the discriminating means reads out the plurality of reflected laser light beams reflected on the object that is
20 irradiated by the optical means, and determines whether or not an interval between the plurality of reflected laser light beams corresponds to the predetermined angle.

3. The apparatus for measuring a three-dimensional shape
25 according to Claim 1, wherein

the optical means comprises a hologram plate for dividing the laser light into the plurality of beams with the predetermined angle.

30 4. The apparatus for measuring a three-dimensional shape according to Claim 1, wherein

the optical means comprises .

a laser light source for emitting the laser light;
a hologram plate for dividing the laser light
emitted from the laser light source into the plurality of beams
with the predetermined angle; and

5 a scanning mirror for scanning the plurality of
beams of the laser light divided by the hologram plate.

5. The apparatus for measuring a three-dimensional shape
according to Claim 1, wherein

10 the optical means comprises

a laser light source for emitting the laser light;
a scanning mirror for scanning the laser light from
the laser light source; and

a hologram plate for dividing a laser light scanned
15 by the scanning mirror into the plurality of beams with the
predetermined angle.

6. The apparatus for measuring a three-dimensional shape
according to Claim 1, wherein

20 the optical means comprises

a laser light source for emitting the laser light;
a hologram plate for dividing the laser light
emitted from the laser light source into the plurality of beams
with the predetermined angle; and

25 a scanning mirror for scanning the plurality of
beams of the laser light divided by the hologram plate.

7. A method for measuring a three-dimensional shape of an
object to be measured by irradiating and scanning the object
30 with a laser light, the method comprising:

dividing the laser light into a plurality of beams with
having a predetermined angle in between for the irradiation;

and

reading out and discriminating each of a plurality of reflected laser light beams, the plurality of the reflected laser light beams corresponding to the plurality of divided beams, respectively, the plurality of divided beams being used for the irradiation.

8. A method for measuring a three-dimensional shape of an object to be measured by irradiating and scanning the object with a laser light, the method comprising:

dividing the laser light into a plurality of beams with having a predetermined angle in between for the irradiation; reading out each of a plurality of reflected laser light beams, the plurality of the reflected laser light beams corresponding to the plurality of divided beams, respectively, the plurality of divided beams being used for the irradiation; and

determining whether or not an interval between the plurality of reflected laser light beams corresponds to the predetermined angle.

9. The method for measuring a three-dimensional shape of an object according to Claim 8, wherein

the determination of whether or not the interval corresponds to the predetermined angle is performed by comparing read-out reflected light data and a predetermined template data.

10. The method for measuring a three-dimensional shape of an object according to Claim 9, wherein

the predetermined template data includes a plurality of patterns.